

# PATENT SPECIFICATION (11)

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## (54) CONDIMENT GRINDER TOOLS

(71) We, PARK GREEN & COMPANY LIMITED, a Company registered under the Laws of England, of Eskdale Road, The Trading Estate, Uxbridge, Middlesex, formerly of 175 High Holborn, London WC1V 6AT, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to condiment grinder tools for a condiment grinder for table use—whether for a grinder for rock salt or for pepper corns.

According to the present invention a pair of co-operating relatively rotatable male and female grinding tools—preferably formed of plastics material—have co-operating grinding surfaces, the grinding surface of one tool having generally helical grinding teeth, and the grinding surface of the other having generally helical lead-in grooves with a pitch substantially closer than that of the teeth in the one tool, and extending over the whole axial length of the grinding surface.

Co-operating toothed metal grinding tools usually are sufficiently strong to operate satisfactorily but with plastics tools there is a danger that if the teeth on the two tools interfere with each other they could easily become worn or otherwise damaged and accordingly it is preferred that there is axial location between the two members, which

The expression 'male and female tools' is defined in this specification as tools, the female of which is annular and surrounds the male.

The invention may be carried into practice in various ways and three embodiments will be described by way of example with reference to the accompanying drawings; in which:

Figures 1 2 and 3 are elevations half in section of three different condiment dispensers suitable for use with tool embodying the invention;

Figure 4 is a sectional elevation of an adaptor fitting and of a grinding tool for co-operation with the adaptor fitting;

Figures 5 and 6 are respectively an elevation and plan of a male tool;

Figure 7 is a diagram showing the shape of the helical grooves on the tool of Figures 5 and 6;

Figure 8 is a sectional elevation of a co-operating female tool; and

Figures 9 and 10 are sections on the line IX—IX and X—X in Figure 8.

All three dispensers comprise co-operating toothed male and female grinding tools 11 and 12 which are respectively located angularly in relation to two different portions of the dispenser body so that when these two portions are turned in relation to each other a grinding action takes place and pieces of rock salt or pepper-corns between the grinding teeth are ground to de-

PATENTS ACT 1949

SPECIFICATION NO 1429310

The following corrections were allowed under Section 76 on 17 September 1976

Page 1, line 23, and Page 3, line 38, *delete closer insert coarser*

THE PATENT OFFICE  
26 October 1976

Bas 31201/9

SLE CORRECTION CLIP ATTACHED

1, 2 and 3 consists of a main body stem 13 and a cap 14; the body stem 13 includes a base 15 which in the case of the dispenser of Figure 3 is separate from the stem and relatively rotatable in relation to the stem.

These three body portions 13, 14 and 15 may be machined from wood or may be of moulded plastics material or any combination of them and in the three examples they are described as made of wood so as to illustrate the manner of use of a moulded plastic adaptor 16 shown in Figure 4.

In the dispenser of Figure 1 the female tool 12 is secured by adhesive or screws 17 in the base 15 and the male tool 11 is fast on the lower end of a square shaft 18 which extends upwards through the whole stem 13 and a bore in the cap 14 to the top of the dispenser where it is screwed into a nut 19 which can be turned to adjust the grinding clearance. The shaft 18 passes through the cap 14 and is keyed into a corresponding square hole 21 in the adaptor 16, which is itself glued and/or screwed into the cap 14 but can rotate within a corresponding counter-bore 23 in the top of the stem 13.

Thus, as the cap 14 is turned by the user in relation to the body 13 and 15, the condiment in the hollow body drops between the grinding tools and is ground for delivery at the bottom of the dispenser.

All the components are non-corrosive as the shaft 18 is of stainless steel and the tools are also either of stainless steel or moulded plastics. A plastics strip 24 is held across the bottom of the female tool 12 by a screw 17 to retain the female tool in position if adhesive is not used or is not sufficient.

The dispenser is filled with rock salt or pepper-corns by unscrewing the screw 19, lowering the male part from the tool, inverting the body and filling it through the hole in the inverted base before reinsertion of the male tool and its shaft to the position shown in Figure 1.

The dispenser of Figure 2 differs from that of Figure 1 in that the condiment is dispensed from an aperture 25 in the cap 14.

The body is filled after inversion and removal of a plug 26 screwed into the lower end, and the grinding action is again performed by turning the cap 14 in relation to the stem 13. In this case however the female tool 12 is secured to the cap 14 while the male tool 11 in its adaptor plate 16 is secured in the counter-bore 23 in the stem 13. Again a nut 19 (this time inside the stem 13) can be adjusted to set the spacing between the grinding tools.

The embodiment of Figure 3 differs from that of Figure 2 only in that the stem 13 is fast with the cap 14 which holds the female tool 12, and the base 15 has the adaptor

16 stuck to it, and the shaft 18 extends from the male tool 11 down near the bottom of the dispenser into the adaptor 16. In this case the dispenser is filled by inverting it, unscrewing the nut 19 and removing the base 15 and adaptor 16 from the shaft 18 so that the stem can be filled through the aperture that is left.

Figure 4 shows the adaptor 16 with its external flange 28 for fastening in an appropriate part of the dispenser and its square hole 21 and Figure 4 also shows that the square shaft 18 which co-operates with the hole 21 is fast with a male tool 11 which has at its lower end three external legs 29 co-operating with a counter-bore 31 formed in the female tool 12 so that when these components are in contact with each other axially, the precise relative position of the teeth on the two tools can be determined. It is of course possible to allow axial movement away from each other by relaxing the nut 19 but it is not possible to move the two tools further towards each other so that the teeth would interfere with each other.

The female tool 12 has a double frusto-conical internal surface in which both the top and bottom halves diverge towards the ends at an angle of  $10^\circ$  to the axis. The male tool shown is of a previously known kind and is on a cone with an angle of  $15^\circ$  to the axis, and this provides an entry into the angular groove for the pepper-corns or rock salt to enter the space between fine grinding teeth 33 and 34 respectively on the male and female tools. These teeth are of helical form with opposite hand with respect to any particle between them.

Above the area of the teeth 33 and 34 both tools have helically curved grooves 35 and 36 also of opposite hand and of coarser pitch than the fine teeth 33 and 34 which serve to provide channels for leading the condiment to the teeth 33 and 34.

The male and female grinding tools shown in Figures 5—10 embody the invention; and can be used as described above. They are intended to be injection moulded from plastics material, but could be cast or machined from stainless steel or other metal.

The male tool 41 is generally of frusto-conical form with a half-cone angle of  $15^\circ$ . Around the frusto-conical part are five helical grooves 43 with a fairly shallow section as shown in Figure 7.

The female tool 42 has two inwardly inclined frusto-conical surfaces which meet in a circle of smallest radius near the median plane of the tool. The upper part 44 has a half-cone angle of  $28^\circ$  and has formed on it relatively-widely pitched teeth 45. The lower part 46 has a half-cone angle of  $10^\circ$  and carries relatively closely pitched sharp teeth 47.

When the tools 41 and 42 are assembled

with the male tool extended upwards into the female tool as it is seen in Figure 8, the grooves 43 and teeth 45 are of opposite hand, and pepper-corns or rock salt lying between them tend, as the male tool is rotated, to be fed down the region of the grooves 43, and also to be partly broken up or crushed by the teeth 45.

Grinding is completed between the teeth 47 and the lower parts of the grooves 43, even though the grooves 43, are shallow and of wide pitch.

Adjustment for wear, or to change the fineness of grinding, can be achieved by adjusting the axial position of the male tool in relation to the female tool by whatever means are used to locate them in respective parts of a salt or pepper grinder body.

The tools can be used for long periods with little wear.

The tools have been designed to be easily withdrawable from a mould while yet having the spiral grooves and teeth 45 which are important for an effective grinder in drawing the rock salt, pepper-corns, or the like, down into the fine grinding portion 46.

#### WHAT WE CLAIM IS:—

1. For a condiment grinder for table use a pair of co-operating relatively rotatable male and female condiment grinding tools having co-operating grinding surfaces, the grinding surface of one tool having generally helical grinding teeth, and the grinding surface of the other having generally helical lead in grooves with a pitch substantially closer than that of the teeth on the one tool, and extending over the whole axial length of the grinding surface.
2. Tools as claimed in Claim 1 which tools have co-operating bearing surfaces which permit rotation but prevent relative axial movement beyond a position in which grinding surfaces on the tools come into contact with each other.
3. Tools as claimed in Claim 1 or Claim 2 either or each of which is moulded from plastics material.
4. Tools as claimed in any of the preceding claims in which both grinding sur-

faces are of frusto-conical form bearing teeth or grooves, the teeth or grooves on one tool being of opposite hand to those on the other tool.

5. Tools as claimed in Claim 4 in which the included angle of the male frustum is greater than that of the female frustum.

6. Tools as claimed in any preceding claim in which the female tool is of double frusto-conical form with fine grinding teeth on one frustum and coarser pitch lead-in grooves on the other.

7. Tools as claimed in any of the preceding claims in combination with a fitting adapted to be keyed to one of the tools and to be secured against rotation in relation to a part of a condiment grinder.

8. Tools as claimed in Claim 7 in which the fitting is of moulded plastics material with a central non-circular hole.

9. Tools as claimed in Claim 7 or Claim 8 in which the fitting is not rotatable in relation to the male tool.

10. Tools as claimed in any of the preceding claims in a condiment grinder, the tools being secured against rotation in relation respectively to two different parts of the grinder.

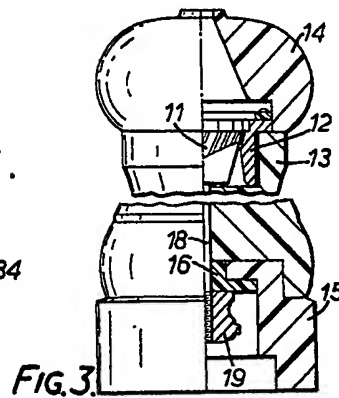
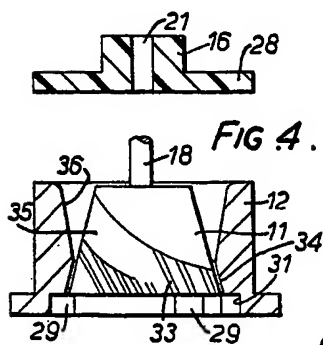
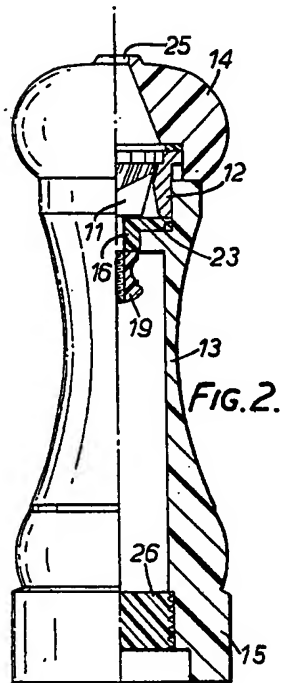
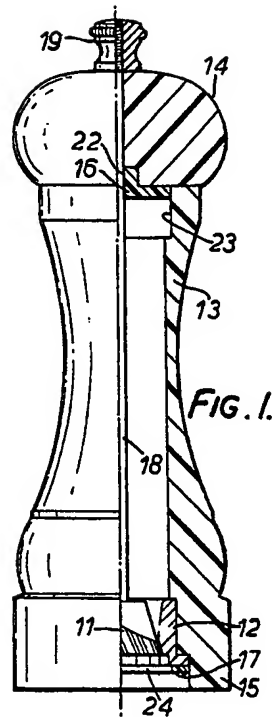
11. Tools as claimed in Claim 10 and any of Claims 7 to 9 in which one of the tools is so secured through the fitting.

12. Tools as claimed in Claim 11 in which the female tool is secured in relation to an upper part of the grinder, whereby ground condiment passing through the female tool is led to an opening in the top of the grinder.

13. Condiment grinding tools for a condiment grinder for table use arranged substantially as herein specifically described with reference to Figures 5 and 7 of the accompanying drawings.

14. A condiment grinder for table use incorporating grinding tools as claimed in Claim 1 and constructed and arranged substantially as herein specifically described with reference to any of Figures 1, 2 and 3 of the accompanying drawings.

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Chartered Patent Agents,  
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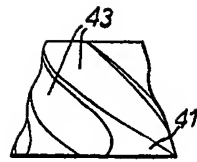


FIG. 5.

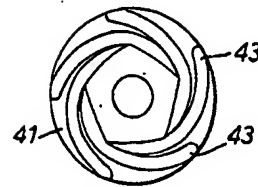


FIG. 6.



FIG. 7.

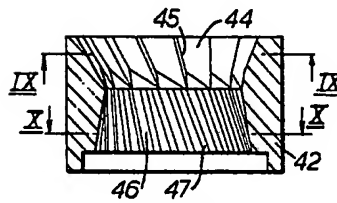


FIG. 8.

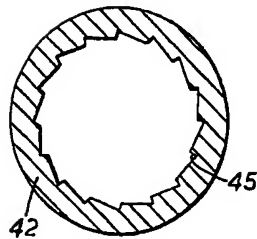


FIG. 9.

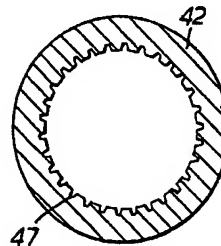


FIG. 10.